EFFECT OF GLYCOPROTEIN C ON THE EXTRACELLULAR STABILITY OF HSV-1 VIRIONS

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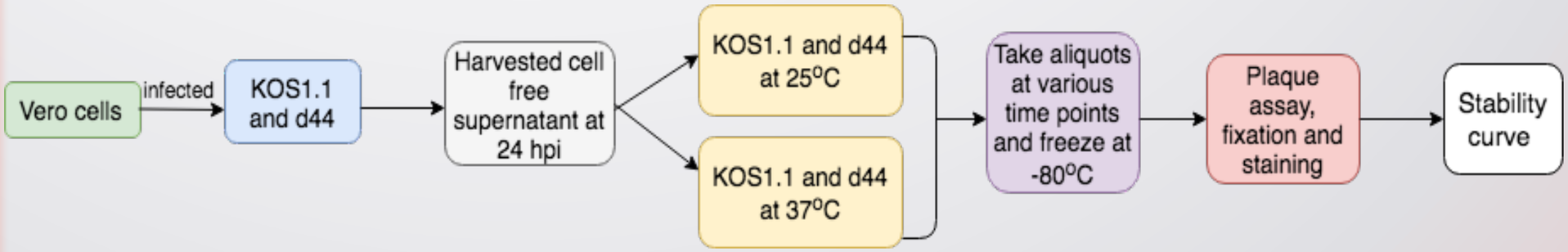
Introduction

- Herpes simplex virus-1 is typically transmitted during childhood via nonsexual contact and has emerged as a principle causative agent of oral herpes in some developed countries.[1]
- One of the criteria for efficient cell spread is that extracellular viruses need to be sufficiently stable in the extracellular environment.[2]
- There is a higher level of extracellular virus release in presence of the protein, glycoprotein C.[3] However, there is no previous data on its effect on the stability of the virus in the extracellular space.

Purpose

- The goal was to determine whether the presence and absence of glycoprotein C, in wild type (KOS1.1) and mutant strains (d44) respectively, change the stability of the extracellular virions.
- **Hypothesis:** Glycoprotein C provides maximum stability to extracellular virions, consistent with its ability to enhance cell-free spread.

Methods



Experiment 1

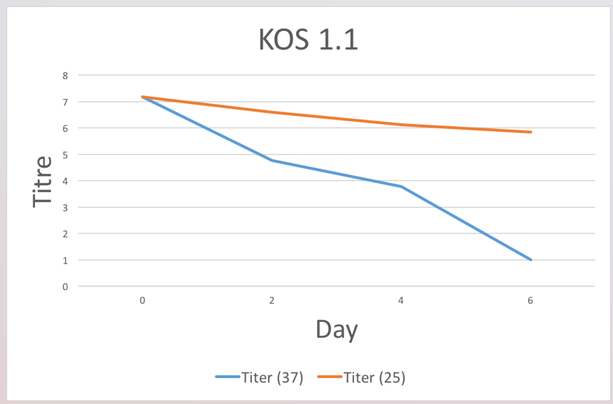


Fig 1: Comparison of stability of wild type virus strain (KOS1.1) at 25°C and 37°C for 6 days.

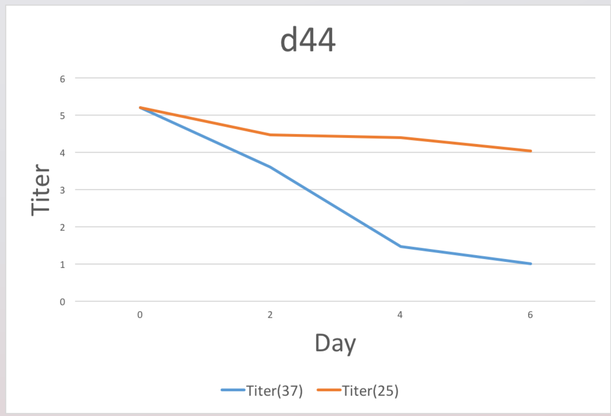


Fig 2: Comparison of stability of mutant type virus strain (d44) at 25°C and 37°C for 6 days.

Experiment 2

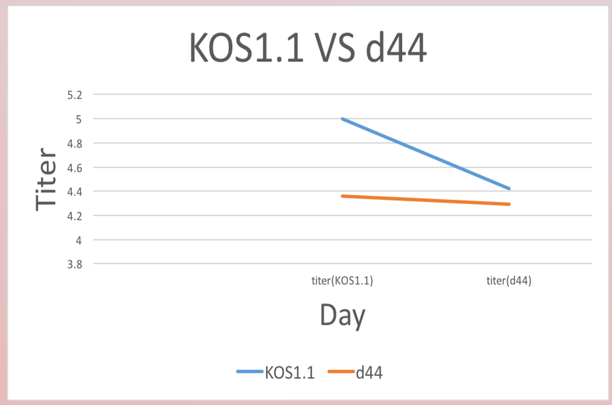


Fig 3: Statistical analysis of the slopes indicated that the stability of d44 was increased relative to KOS1.1; p-value = 0.0377

Discussion

- At 25°C, stability decreased at a similar rate in both wild-type and mutant virus strains. (Fig 1 & 2)
- Both viruses are less stable at 37°C. (Fig 1 & 2)
- The stability for mutant strain decreases at a lower rate than for wild-type strain at 37°C. (Fig 3)

Conclusion

- The results of the experiment do not match the hypothesis since d44 is observed to be more stable than KOS1.1.
- This conclusion provides scope for more interesting research in the area of stability of extracellular virions in the presence/absence of glycoprotein C.

References

1. Xu, Fujie, et al. "Trends in herpes simplex virus type 1 and type 2 seroprevalence in the United States." Jama 296.8 (2006): 964-973.
2. Zhong, Peng et al. “Cell-to-Cell Transmission of Viruses.” Current opinion in virology 3.1 (2013): 44–50. PMC. Web. 24 June 2017.
3. T. Frost and S. Rice, manuscript in preparation.